



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,403	08/26/2003	Masahiro Shimoya	4041K-000149	6400

27572 7590 09/28/2005

HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER

WALBERG, TERESA J

ART UNIT PAPER NUMBER

3753

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

he

<b>Office Action Summary</b>	<b>Application No.</b> 10/649,403	<b>Applicant(s)</b> SHIMOYA ET AL.	
	<b>Examiner</b> Teresa J. Walberg	<b>Art Unit</b> 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/26/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kroger (5,623,989).

Kroger discloses a heat exchanger (see abstract) provided with a plurality of tubes (2), arranged in parallel with each other, and sheet like fins attached so as to bridge the intervals between facing tubes (see Fig. 1), meandering projections being formed at said fins, projections being formed at said fins meander centered about a basic direction of flow of the second fluid so as to be directed toward the tubes (Figs. 1, 3, and 6), the fins being corrugated fins bent to wave shapes between facing tubes (see Fig. 6), the fins being plate fins of basically plate shapes (Fig. 2).

3. Claims 1, 2, 3, 6, 8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Kido et al (JP 62-284197).

Kido et al disclose a heat exchanger (see English language abstract) provided with a plurality of tubes (1), arranged in parallel with each other and sheet like fins (4) attached so as to bridge the intervals between facing tubes (see Fig. 2), meandering projections being formed at said fins (Figs. 2 and 3),

Art Unit: 3753

projections being formed at said fins meander centered about a basic direction of flow of the second fluid so as to be directed toward the tubes (Figs. 2 and 3), the fins being corrugated fins bent to wave shapes between facing tubes (see Fig. 1), the tubes (1) having outer surfaces with flat sectional shapes (Fig. 2), the tubes having a plurality of fluid passages (Fig. 2).

4. Claims 1, 2, 4, 5, 7, 14, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Lu (3,515,207).

Lu discloses a heat exchanger (see abstract) provided with a plurality of tubes (12), arranged in parallel with each other, and sheet like fins (10) attached so as to bridge the intervals between facing tubes (see Figs. 1 and 2), meandering projections being formed at said fins (Figs. 1 and 2), projections being formed at said fins meander centered about a basic direction of flow of the second fluid so as to be directed toward the tubes (Figs. 1 and 2), the fins being plate fins of basically plate shapes (Fig. 4), the tubes (12) having outer surfaces with substantially circular sectional shapes (Fig. 2), the fins having relief shapes formed on the top surfaces of the meandering projections of the fins (see Fig. 2), and a plurality of tubes arranged on an identical virtual plane and another plurality of tubes arranged on another virtual plane facing that plane (Fig. 2).

5. Claims 1, 2, 4-9, 11, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Modine (1,553,093).

Modine discloses a heat exchanger (Fig. 6) provided with a plurality of tubes (11), arranged in parallel with each other, and sheet like fins (16) attached so as to bridge the intervals between facing tubes (see Fig. 6), meandering projections (14) being formed at said fins (Fig. 6), projections being formed at said fins meander centered about a basic direction of flow of the second fluid so as to be directed toward the tubes (Fig. 6), the fins (16) being plate fins of basically plate shapes (Fig. 6), the tubes (11) having outer surfaces with substantially circular sectional shapes (Fig. 6), the fins having relief shapes formed on the top surfaces of the meandering projections of the fins (see Fig. 2), the fins being corrugated fins bent to wave shapes between facing tubes (see Fig. 13), the tubes having outer surfaces with flat sectional shapes (page 2, line 71) or wedge shaped sectional shapes (Fig. 11), the tubes forming single fluid passages (Fig. 11).

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Modine (1,553,093) in view of Memory (2004/0149424).

Modine discloses a heat exchanger having the claimed structure with the exception of the wedge shaped tubes having a plurality of passages.

Art Unit: 3753

Memory teaches the use of Wedge shaped heat exchanger tubes having pluralities of fluid passages. See Fig. 12.

It would have been obvious in view of Memory to provide the wedge shaped tubes of Modine with a plurality of passages, the motivation being to distribute the flow to all parts of the tubes.

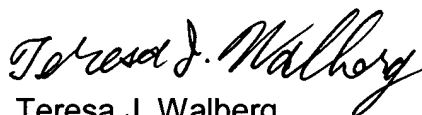
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Seemiller, Kalnin et al, Lu (4,434,846), Krekacs et al, Hughes, Sakuma et al, Ikeya et al, and Kang et al are cited to show fin structure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa J. Walberg whose telephone number is 571-272-4790. The examiner can normally be reached on M-F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene Mancene can be reached on 571-272-4930. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3753

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Teresa J. Walberg  
Primary Examiner  
Art Unit 3753

tjw